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SPECIFICATIONS OF SIGNALLING SYSTEM No. 7

STAGE 3 DESCRIPTION FOR COMMUNITY OF INTEREST SUPPLEMENTARY SERVICES USING SS No. 7

Clause 1 – Closed User Group (CUG)

**Clause 3 – Multilevel precedence and
preemption**

ITU-T Recommendation Q.735

(Previously “CCITT Recommendation”)

FOREWORD

The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the International Telecommunication Union. The ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Conference (WTSC), which meets every four years, established the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

ITU-T Recommendation Q.735, clauses 1 and 3, was prepared by the ITU-T Study Group XI (1988-1993) and was approved by the WTSC (Helsinki, March 1-12, 1993).

NOTES

1 As a consequence of a reform process within the International Telecommunication Union (ITU), the CCITT ceased to exist as of 28 February 1993. In its place, the ITU Telecommunication Standardization Sector (ITU-T) was created as of 1 March 1993. Similarly, in this reform process, the CCIR and the IFRB have been replaced by the Radiocommunication Sector.

In order not to delay publication of this Recommendation, no change has been made in the text to references containing the acronyms “CCITT, CCIR or IFRB” or their associated entities such as Plenary Assembly, Secretariat, etc. Future editions of this Recommendation will contain the proper terminology related to the new ITU structure.

2 In this Recommendation, the expression “Administration” is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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STAGE 3 DESCRIPTION FOR COMMUNITY OF INTEREST SUPPLEMENTARY SERVICES USING SS No. 7

(Helsinki, 1993)

1 Closed User Group (CUG)

1.1 Definition

The supplementary service Closed User Group (CUG) enables users to form groups, to and from which access is restricted. A specific user may be a member of one or more CUGs. Members of a specific CUG can communicate among themselves but not with users outside the group. Specific CUG members can have additional capabilities that allow them to originate calls outside the group, and/or to receive calls from outside the group. Specific CUG members can have additional restrictions that prevent them from originating calls to other members of the CUG, or from receiving calls from other members of the CUG.

1.2 Description

1.2.1 General description

A CUG is a group of users who may be members of one or several public networks; each ISDN member of a CUG is identified by an ISDN number.

The Closed User Group (CUG) supplementary service enables a group of users to intercommunicate only among themselves or, as required, one or more users may be provided with incoming/outgoing access to users outside the group.

The stage 1 definition of the CUG service is given in Recommendation I.255. The stage 2 description including network functions are given in Recommendation Q.85.1, and the stage 3 DSS 1 description is given in Recommendation Q.955.1. This stage 3 description of the CUG uses the ISDN User Part protocol as defined in Recommendations Q.761-Q.764 and Q.730.

The realization of the CUG facilities is done by the provision of interlock codes and is based on various validation checks as defined in Recommendation Q.85 at call set-up, determining whether or not a requested call to or from a user having a CUG facility is allowed. In particular, a validation check is performed by verifying that both the calling and called parties belong to the CUG indicated by the interlock code.

The data for each CUG that a user belongs to can either be stored at the local exchange to which the user is connected (decentralized administration of CUG data), or at dedicated point(s) in the network (centralized administration of CUG data).

In 1.5.2.1.1 i) the call set-up procedure based on decentralized administration of CUG data is specified making use of the ISDN User Part as defined in Recommendations Q.761-764 and Q.766.

In 1.5.2.1.1 ii) the call set-up procedure based on centralized administration of CUG data is specified making use of the ISDN User Part as defined in Recommendations Q.761-764, Q.766 and Q.767 and the Transaction Capabilities (TC) as defined in Recommendations Q.771-775.

In 1.5.2.1.1 ii) the application service element (ASE) on top of Transaction Capabilities for CUG validation check with centralized administration of CUG data is specified.

1.2.2 Specific terminology

CUG: Closed User Group.

Calling Party Number is the network (e.g. E.164) number of the calling party.

Called Party Number is the network (e.g. E.164) number of the called party.

CUG Interlock Code is the code to uniquely identify a CUG inside the network.

Called User Index is the local index at the called user to identify a particular CUG he belongs to.

CMC: CUG Management Centre

1.2.3 Qualification on the applicability to telecommunication services

Not applicable.

1.2.4 State definitions

No specific state definitions are required.

1.3 Operational requirements

1.3.1 Provision/withdrawal

See Recommendation I.255.1.

1.3.2 Requirements on the originating network side

Not applicable.

1.3.3 Requirements in the network

No specific network requirement identified.

1.3.4 Requirements on the terminating network side

Not applicable.

1.4 Coding requirements

Clause 3/Q.763 gives the coding for the Closed User Group interlock code and the Optional forward call indicator parameters which are required to support this service.

See Tables 1-1 through 1-10.

TABLE 1-1/Q.735

Action at the gateway with a network without CUG capability

CUG call indicator in IAM	Action at the gateway exchange
CUG without outgoing access	Release the call with cause #29
CUG with outgoing access	Treat the call as an ordinary call ^{a)}
Non-CUG	Treat the call as an ordinary call
^{a)} Discard the interlock code parameter and change the CUG call indicator of the optional forward call indicator to non-CUG call or discard the whole parameter if appropriate.	

TABLE 1-2/Q.735

Handling of a CUG call at the destination exchange

CUG call indicator in IAM	CUG match check	Class of called user				No CUG
		CUG		CUG+IA		
		No ICB	ICB	No ICB	ICB	
CUG with OA not allowed	Match	CUG call	Release cause #55	CUG call	Release cause #55	Release the call with cause #87
	No match	Release the call with cause #87		Release the call with cause #87		
CUG with OA allowed	Match	CUG call	Release cause #55	CUG+OA call	Non-CUG call	Non-CUG call
	No match	Release the call with cause #87		Non-CUG call		
Non-CUG	–	Release the call with cause #87		Non-CUG call		Non-CUG call

IA Incoming access

OA Outgoing access

ICB Incoming calls barred

Match called The interlock code in the received IAM matches one of the CUGs to which the user belongs.

No match The interlock code does not match any of the CUGs to which the called user belongs.

NOTE – As OA attribute of the called user is of no concern at the destination exchange, CUG+OA class is equivalent to CUG, and CUG+IA class is equivalent to CUG+IA in this table. Subscription of preferential CUG by the called user is also of no concern in this table.

TABLE 1-3/Q.735

Validation check of CUG call concerning the calling user

Calling user class	Indication from calling user				
	CUG call with index	CUG+OA call with index	CUG call without index	CUG+OA call without index	Non-CUG call
CUG without pref.	CUG call (*1) (*3) IC: spec. CUG	CUG call (*1) (*3) IC: spec. CUG	Return Error cause #62	Return Error cause #62	Return Error cause #62
CUG+OAE without pref.	CUG call (*1) (*3) IC: spec. CUG	CUG+OA (*2) (*3) IC: spec. CUG	Return Error cause #62	Non-CUG call	Return Error cause #62
CUG+OAI without pref.	CUG+OA (*2) (*3) IC: spec. CUG	CUG+OA (*2) (*3) IC: spec. CUG	Non-CUG call	Non-CUG call	Non-CUG call
CUG with pref.	CUG call (*1) (*3) IC: spec. CUG	CUG call (*1) (*3) IC: spec. CUG	CUG (*4) call IC: pref. CUG	Return Error cause #62	CUG call IC: pref. CUG (*4)
CUG+OAE with pref.	CUG call (*1) (*3) IC: spec. CUG	CUG+OA (*2) (*3) IC: spec. CUG	CUG (*4) IC: pref. CUG	Non-CUG call	CUG call (*4) pref. CUG
CUG+OAI with pref.	CUG+OA (*1) (*2) (*3) IC: spec. CUG	CUG+OA (*2) (*3) (*1) IC: spec. CUG	(*4) (*5)	CUG+OA (*1) (*4) IC: pref. CUG	(*4) (*5)
No CUG	Return Error cause #50	Return Error #50	Return Error #50	Return Error #50	Non-CUG call

OAE Outgoing access, explicit request required.

OAI Outgoing access, implicit outgoing access for all calls.

IC Interlock code of the CUG selected.

NOTE – As IA (incoming access) attribute of the calling user is of no concern for this validation check, CUG+OA/IA is equivalent to CUG+OA in this table.

(*1) In case of OCB (outgoing calls barred) within the Error with cause #53.

(*2) In case of OCB within the CUG, the call is interpreted as a non-CUG call.

(*3) In case the specified index does not match any of the registered indices, Return Error with cause #90.

(*4) In the case of OCB within the CUG, this combination is not allowed.

(*5) Both “Preferential CUG” and “implicit” outgoing access options imply that no subscriber procedures are needed to invoke either options when placing a call. When a user subscribes to both options, the network does not know which option the user is invoking, if no additional procedures are used when placing the call. Then one of the following operations are recommended:

- a) if no information is given, the preferential CUG will be assumed;
- b) the network will route the call with preferential CUG with outgoing access. The call will therefore be connected if the called access is:
 - a member of preferential CUG; or
 - a member of another CUG with incoming access; or
 - a non-CUG user.

TABLE 1-4/Q.735

Validation check of CUG call concerning the called user

CUG call ind. in IAM	CUG match check	Class of called user				
		CUG		CUG+IA		
		No ICB	ICB	No ICB	ICB	
CUG with OA not allowed	Match	CUG call	Return Error cause #55	CUG call	Return Error cause #55	Return Error with cause #87
	No match	Return Error with cause #87		Return Error with cause #87		
CUG with OA allowed	Match	CUG call	Return Error cause #55	CUG+OA call	Non-CUG call	Non-CUG call
	No match	Return Error with cause #87		Non-CUG call		
Non-CUG	–	Return Error with cause #87		Non-CUG call		Non-CUG
Match The interlock code in the receive IAM matches one of the CUGs the called user belongs to.						
No match The interlock code does not match any of the CUGs the called user belongs to.						
NOTES						
1 As OA (outgoing access) attribute of the called user is of no concern at the destination exchange, CUG+OA class is equivalent to CUG and CUG+OA/IA class is equivalent to CUG+IA in this table.						
Subscription of preferential CUG by the called user is also of no concern in this table.						
2 The ASN.1 information for the centralized CUG service is contained in Appendix I.						

Parameters of operations and outcomes

CUG Check 1

NOTES

- 1 The CallingPartyNumber (10.3) is the network (e.g. E.164) number of the calling party. It is expressed in the same manner as the ISUP Calling party number in 3.8/Q.763. The code of this parameter is “10000011”.
- 2 The CUGInterlockCode (10.5) is the code to uniquely identify a CUG inside the network. It is expressed in the same manner as the ISUP CUG interlock code in 3.13/Q.763. The code of this parameter is “10000101”.
- 3 The BearerCapability (10.9) is expressed in the same manner as the Bearer capability information element (octets 3 & 4) from 4.5.1/Q.931 to 4.5.29/Q.931. The code for this parameter is “10001000”.

CUGCheck1		OPERATION
PARAMETER	SEQUENCE	{ BearerCapability, CUGCallIndicator, CallingPartyNumber, CallingUserIndex OPTIONAL, HighLayerCompatibility OPTIONAL }
RESULT	SEQUENCE	{ CUGCallIndicator, CUGInterlockCode OPTIONAL }
ERRORS		{ UnsuccessfulCheck }

::= 1

TABLE 1-6/Q.735

Parameters of operations and outcomes**CUG Check 2**

CUG Check 2	Timer = 5-10 sec	Class = 1	Code = 00000010
Parameters with Invoke		Opt/Man	Reference
CUGInterlockCode		O	10.5
CUGCallIndicator		M	10.2
CalledPartyNumber		M	10.4
BearerCapability		M	10.9
HighLayerCompatibility		O	10.10
Parameters with Return Result			
CalledUserIndex		O	10.6
CUGCallIndicator		M	10.2
Linked Operations			
Not applicable			
Errors			
Unsuccessful Check			10.7
NOTES			
1 The CalledPartyNumber (10.4) is the network (e.g. E.164) number of the called party. It is expressed in the same manner as the ISUP Called party number in 3.7/Q.763. The code of this parameter is “10000100”.			
2 The CalledUserIndex (10.6) is the local index at the called user to identify a particular CUG the called user belongs to. The code of this parameter is “10000110”.			
3 The HighLayerCompatibility (10.10) is expressed in the same manner as the High layer compatibility information element (octet 3) from 4.5.1/Q.931 to 4.5.29/Q.931. The code of this parameter is “10001001”.			
CUGCheck2		OPERATION	
PARAMETER	SEQUENCE	{ BearerCapability, CUGCallIndicator, Called PartyNumber, CUGInterlockCode OPTIONAL, HighLayerCompatibility OPTIONAL }	
RESULT	SEQUENCE	{ CUGCallIndicator, CalledUserIndex OPTIONAL }	
ERRORS	{ UnsuccessfulCheck }		
::= 2			

TABLE 1-7/Q.735

Parameter coding

CallingUserIndex		Code = 10000001
Contents	Meaning	
Integer	Binary representation of the CUG index	
NOTE – The CallingUserIndex (10.1) is the local index at the calling user to identify a particular CUG the calling user belongs to. CallingUserIndex ::= [1] IMPLICIT LocalIndex LocalIndex ::= INTEGER (0 .. 32767) -- Some networks may specify a maximum value of the CUG Index from 0 to 9999.		

TABLE 1-8/Q.735

CUGCallIndicator

CUGCallIndicator		Code=10000010
Contents	Meaning	
00000000	Non-CUG call	
00000001	Non-CUG call	
00000010	CUG call with outgoing access	
00000011	CUG call without outgoing access	
NOTE – The CUGCallIndicator (10.2) indicates whether the call is requested or designated as a CUG call and whether outgoing access is requested or allowed. CUGCallIndicator :: [2] IMPLICIT CallIndicator CallIndicator :: INTEGER { NonCUGCall (0), NonCUGCall (1), outgoingAccessAllowedCUGCall (2), outgoingAccessNotAllowedCUGCall (3) }		

TABLE 1-9/Q.735

Errors

UnsuccessfulCheck	Code = 00000001
Parameters	
Cause	10.8
UnsuccessfulCheck Error PARAMETERS { Cause } ::= 1	

TABLE 1-10/Q.735

Cause

Cause	Code = 10000111
Contents binary (decimal)	Meaning
00110010 (50) 00110101 (53) 00110111 (55) 00111110 (62) 01011010 (90) 01010111 (87) 01011000 (88) 01101111 (111)	Requested facility not subscribed Outgoing calls barred within CUG Incoming calls barred within CUG InconsistencyInDesignatedOutgoing AccessInformationAndSubscriber Class Non-existent CUG User not member of CUG Incompatible destination Protocol error, unspecified
NOTE – The Cause indicates the reason why the CUG check is unsuccessful. Cause ::= [7] IMPLICIT CauseCode CauseCode ::= INTEGER { RequestedFacilityNotSubscriber (50), outgoingCallsBarredWithinCUG (53), incomingCallsBarredWithinCUG (55), inconsistencyInDesignatedOutgoing- AccessInformationAndSubscriberClass (62), UserNotMemberOfCUG (87), IncompatibleDestination (88), ProtocolErrorUnspecified (111) }	

1.5 Signalling requirements

1.5.1 Activation/deactivation/registration

Not applicable.

1.5.2 Invocation and operation

1.5.2.1 Actions at the originating local exchange

1.5.2.1.1 Normal operation

Upon receipt of a request for CUG service the network shall check its validity in conjunction with the access capabilities contained in the user profile. If a non-valid request is received or the checks cannot be performed, then the network shall reject the call and return an appropriate indication to the calling user.

The realization of the CUG facilities is accomplished by the provision of interlock codes and is based on various validation checks as defined in Recommendation Q.85 at call set-up, determining whether or not a requested call to or from a user having a CUG facility is allowed. In particular, a validation check is performed by verifying that both the calling and called parties belong to the CUG indicated by the interlock code.

The data for each CUG that a user belongs to, can either be stored at the originating local exchange to which the user is connected (decentralized administration of CUG data), or at dedicated point(s) in the network (centralized administration of CUG data).

i) Normal operation with decentralized administration of CUG data

The actions at the originating exchange at call set-up from a user belonging to a CUG, depends on the result of the validation checks performed, based on whether the user belongs to one or more CUGs and on the combination of CUG facilities that applies.

a) CUG without outgoing access

If the result of the validation check indicates that the call should be dealt with as a CUG call, the interlock code of the selected CUG is obtained. The initial address message forwarded to the next exchange then includes the interlock code together with an indication that the call is a CUG call without outgoing access. The ISUP preference indicator of the forward call indicators parameter in the IAM is set to "ISUP required all the way".

b) CUG call with outgoing access

If the result of the validation check indicates that the call should be dealt with as a CUG call with outgoing access, the interlock code of the selected CUG together with an outgoing access indication is obtained. The initial address message forwarded to the next exchange then includes the interlock code together with an indication that the call is a CUG call for which outgoing access is allowed. The ISUP preference indicator of the forward call indicators parameter in the IAM is set to "ISUP preferred all the way", unless another service requires a more stringent setting.

c) Non-CUG

If the result of the validation check indicates that the call should be dealt with as a non-CUG call, the initial address message forwarded to the next exchange then does not include an interlock code nor a CUG call indication.

d) Call rejected

If the result of the validation check indicates that the call is to be rejected, the call set-up is not initiated.

See Table 1-3.

ii) Normal operation with centralized administration of CUG data

NOTE – This procedure is not compatible with the *Blue Book* version of centralized CUG. However, the possibility exists to map binary characters to IA5 characters.

In the local exchange an indication is stored, showing only whether the user has either none or one of the Closed User Group facilities.

The originating exchange requests the CUG validation check to the dedicated point by invocation of the “CUG check 1” operation through TC. This operation and associated parameters are described in Figure 1-3. The following actions at the originating exchange depend on the result of this validation check.

a) *CUG call indication*

If the result of the validation check for the calling user at the originating exchange indicates that the check for the calling user has been successful, the interlock code of the selected CUG possibly together with an outgoing access indication is obtained. The initial address message forwarded to the next exchange then includes the interlock code together with an indication that the call is a CUG call without outgoing access or a CUG call with outgoing access.

b) *Non-CUG call indication*

If the result of the validation check indicates that the call should be dealt with as a non-CUG call, the initial address message forwarded to the next exchange then does not include an interlock code or a CUG call indication.

c) *Call rejected*

If the result of the validation check indicates that the call is to be rejected, the call set-up is not initiated.

ASE for CUG service with centralized administration of CUG data

The application service element (ASE) for CUG service with centralized administration of CUG data provides the procedures between the exchanges and the CUG management centres (CMC) for CUG validation check.

Two similar but different procedures are defined for CUG validation check. One is the procedure between the originating exchange of a CUG call and a CMC to check the qualification of the calling user to establish the present CUG call. The other is the procedure between the terminating exchange of a CUG call and a CMC to check the qualification of the called user to accept the present CUG call. One TC operation is defined for each of these procedures.

Procedure

CUG Check 1

This operation is used between the originating exchange of a call and dedicated point for CUG validation check of the calling user.

To check the qualification of the calling user the originating exchange initiates the transaction to the CMC by invocation of the CUG Check 1 operation with appropriate parameters. The CMC, in response to this invocation, terminates the transaction with the check result. The check result contains the interlock code and other parameters in case of successful check or an error cause in case of unsuccessful check. Figure 1-3 shows the primitive flows between the ASE and the TC at the exchange and between the ASE and the TC at the CMC for this case. Table 1-3 shows the result of the validation check which is performed by the CMC, according to various parameters, concerning the calling use.

1.5.2.1.2 Exceptional procedures

No exceptional procedures are identified.

1.5.2.2 Actions at the transit exchange

1.5.2.2.1 Normal operation

Each transit exchange sets up a CUG call as an ordinary call. The information related to the CUG facilities received from the preceding exchange, i.e. an interlock code, a CUG call indication possibly with an indication that outgoing access is allowed, is forwarded to the succeeding exchange.

1.5.2.2.2 Exceptional procedures

No exceptional procedures are identified.

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1.5.2.3 Actions at the outgoing international gateway exchange

1.5.2.3.1 Normal operation

In the case of an international CUG call, no special functions are required at the gateway exchange provided that the international interlock code assigned to the international CUG concerned is used in the national network at the gateway exchange. However, in the case where a national interlock code other than the applicable international interlock code is used within a national network, interlock code conversion is required at the gateway exchange.

1.5.2.3.2 Exceptional procedures

No exceptional procedures are identified.

1.5.2.4 Actions at the incoming international gateway exchange

1.5.2.4.1 Normal operation

In the case of an international CUG call, no special functions are required at the gateway exchange provided that the international interlock code assigned to the international CUG concerned is used in the national network at the gateway exchange. However, in the case where a national interlock code other than the applicable international interlock code is used within a national network, interlock code conversion is required at the gateway exchange.

1.5.2.4.2 Exceptional procedures

In case of interworking with a network which does not support the CUG facility, the incoming gateway exchange may release the call depending on the contents of the CUG call indicator in the received IAM. The action at the gateway exchange, in this case, is indicated in Table 1-1. In cases where a call is rejected as the result of the interworking, a release message including the cause parameter indicating #29 Facility rejected + diagnostics indicating CUG without access is sent towards the originating exchange.

1.5.2.5 Actions at the destination local exchange

1.5.2.5.1 Normal operation

i) Decentralized CUG

At the destination exchange a validation check of the acceptability of a call is made according to the rule specified in Recommendation Q.85 where either the calling party (as indicated by a CUG call indication or the CUG interlock code in the initial address message received) or the called party belongs to a CUG. The call set-up is continued only in cases where the information received checks with the information stored at the destination exchange. Table 1-2 indicates the action to be taken by the destination exchange as the result of the validation check.

In cases where a call is rejected as the result of the validation check because of incompatible CUG information, a release message including the cause parameter indicating one of the following values is sent towards the originating exchange:

#29	Facility rejected + diagnostics indicating CUG without OA
#55	Incoming calls barred within CUG
#87	User not member of CUG
#111	Protocol error, unspecified.

Figure 1-1 illustrates example message flows for CUG calls with decentralized administration of CUG data.

ii) Centralized CUG

In the case of an incoming CUG call for which the validation check for the calling user has successfully been performed, by the validation of the CUG call indication or the CUG interlock code. The received initial address message includes the interlock code and CUG call indication possibly with an indication that outgoing access is allowed. The destination exchange then forwards the information received in the initial address message to the dedicated point for CUG validation check. In this case, the destination exchange invokes the "CUG Check 2" operation through TC. This operation and associated parameters are defined below.

a) *Check successful indication*

If the result of the validation check indicates that the check has been successful, the index of the CUG selected for the called user and possibly an outgoing access indication are obtained. The CUG call set-up request is forwarded to the called user with these indications.

b) *Non-CUG call indication*

If the result of the validation check indicates that the call should be dealt with as a non-CUG call, the set-up request of a non-CUG call is forwarded to the called user.

c) *Call rejected*

If the result of the validation check indicates that the call is rejected, the reason why the call has been rejected is obtained. A release message including the cause parameter indicating one of the values, as listed in 1.5.2.5.1, is sent towards the originating exchange.

ASE for CUG service with centralized administration of CUG data

The application service element (ASE) for CUG service with centralized administration of CUG data provides the procedures between the exchanges and the CUG management centres (CMC) for CUG validation check.

The TC operation for the procedure between the terminating exchange of a CUG call and a CMC to check the qualification of the called user to accept the present CUG call is defined.

Procedure

CUG Check 2

This operation is used between the terminating exchange of a call and dedicated point for CUG validation check of the called user.

To check the qualification of the called user, the terminating exchange initiates the transaction to the CMC by invocation of the CUG Check 2 operation with appropriate parameters. The CMC, in response to this invocation, terminates the transaction with the check result. The check result contains the index number for the called user and other parameters in case of successful check or an error cause in case of unsuccessful check. Figure 1-4 shows the primitive flows between the ASE and the TC at the exchange and between the ASE and the TC at the CMC for this case. Table 1-4 shows the result of the validation check which is performed by the CMC, according to various parameters, concerning the called user.

At the dedicated point, the CUG validation check is performed according to the rules defined in Recommendation Q.85. The procedures between the dedicated point and the exchange follow those as defined in the ASE part of this Recommendation.

1.5.2.5.2 Exceptional procedures

If a non-CUG call is received with a CUG interlock code, or a CUG call is received without interlock code, then the call shall be released with cause #111 “protocol error, unspecified”.

1.6 Interactions with other supplementary services

1.6.1 Call waiting (CW)

No impact on ISUP.

1.6.2 Call transfer services

No applicable interaction at this time.

1.6.3 Connected line identification presentation (COLP)

No impact on ISUP.

1.6.4 Connected line identification restriction (COLR)

No impact on ISUP.

1.6.5 Calling line identification presentation (CLIP)

No impact on ISUP.

1.6.6 Calling line identification restriction (CLIR)

No impact on ISUP.

It is an option to allow invocation of CLIR in connection with a CUG call.

1.6.7 Closed User Group (CUG)

Not applicable.

1.6.8 Conference calling (CONF)

No impact on ISUP.

All conferees shall belong to the same Closed User Group. When adding a new conferee, the Closed User Group restrictions shall be checked before the new conferee is allowed to enter the conference.

This check is under the responsibility of the conference controller.

1.6.9 Direct dialling-in (DDI)

No impact on ISUP.

When the direct dialling-in supplementary service applies, the CUG supplementary membership shall not be available for each direct dialling-in number, but instead shall be on the basis of the entire range of direct dialling-in numbers applicable at an access or group of accesses.

1.6.10 Call diversion services

1.6.10.1 Call forwarding busy (CFB)

No impact on ISUP.

CUG restrictions must be met between the calling user and every intermediate forwarding user. The parameters of the CUG requested by the calling user will be used for the forwarding call and by this means CUG restrictions must be met between the calling user and the forwarded to user.

Served user B outgoing barring attributes will not be used to determine if forwarding can be done.

1.6.10.2 Call forwarding no reply (CFNR)

No impact on ISUP.

1.6.10.3 Call forwarding unconditional (CFU)

No impact on ISUP.

1.6.10.4 Call deflection (CD)

No impact on ISUP.

1.6.11 Line hunting (LH)

No impact on ISUP.

1.6.12 Three-party service (3PTY)

No impact on ISUP.

NOTE – For the successful invocation of the three-party supplementary service, any CUG restrictions normally applied to individual CUG calls between user A-B or A-C shall still apply when the three-party service is invoked, i.e. the CUG check procedure is only performed on each individual leg of the call.

1.6.13 User-to-user signalling (UUS)

1.6.13.1 User-to-user signalling, service 1 (UUS1)

No impact on ISUP.

1.6.13.2 User-to-user signalling, service 2 (UUS2)

No impact on ISUP.

1.6.13.3 User-to-user signalling, service 3 (UUS3)

No impact on ISUP.

1.6.14 Multiple subscriber number (MSN)

No impact on ISUP.

1.6.15 Call hold (HOLD)

No impact on ISUP.

1.6.16 Advice of charge (AOC)

No impact on ISUP.

1.6.17 Sub-addressing (SUB)

No impact on ISUP.

1.6.18 Terminal portability (TP)

No impact on ISUP.

1.6.19 Completion of calls to busy subscriber (CCBS)

No applicable interaction at this time.

1.6.20 Malicious call identification (MCID)

No impact on ISUP.

1.6.21 Reverse charging (REV)

No impact on ISUP.

1.6.22 Multilevel precedence and preemption (MLPP)

No impact on ISUP.

1.6.23 Private numbering plan (PNP)

No applicable interaction at this time.

1.6.24 Charge card

No applicable interaction at this time.

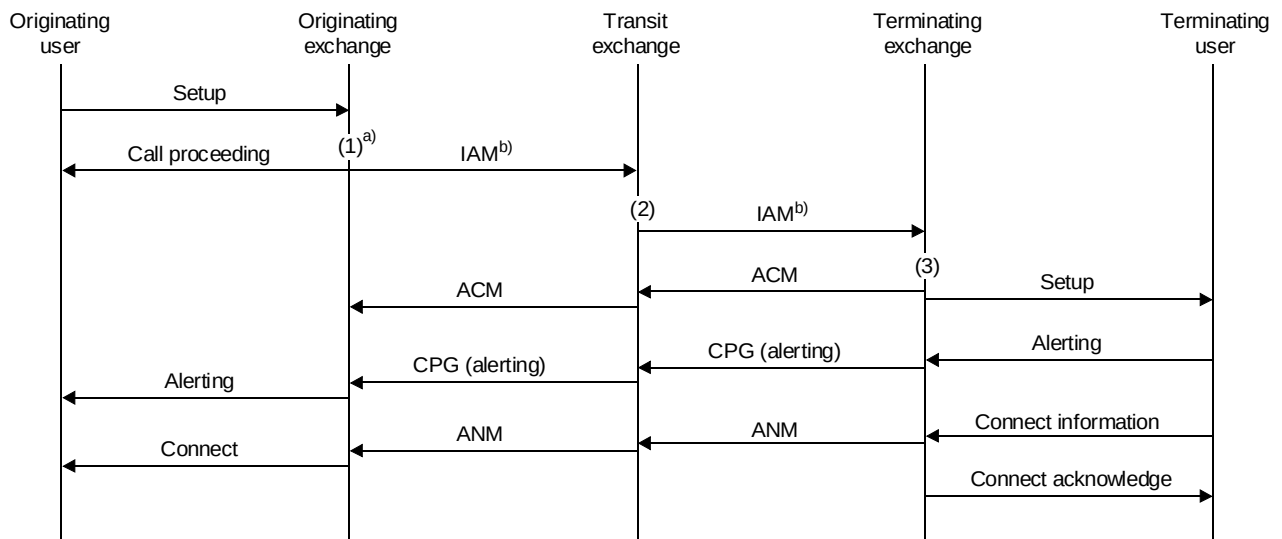
1.7 Interaction with other networks

A CUG may span over several networks. In this case the responsibility for the management of this CUG is in one of these networks; in addition, there is a need for a CUG identification mechanism that would be accepted by all of the encompassed networks. One such mechanism presently exists for CUGs spanning over data networks having X.121 as the numbering plan (see Recommendation X.180, Administrative Arrangements for International Closed User Groups). An equivalent mechanism should be defined for CUGs on networks using the E.164 numbering plan, or on networks which do not use the same numbering plan.

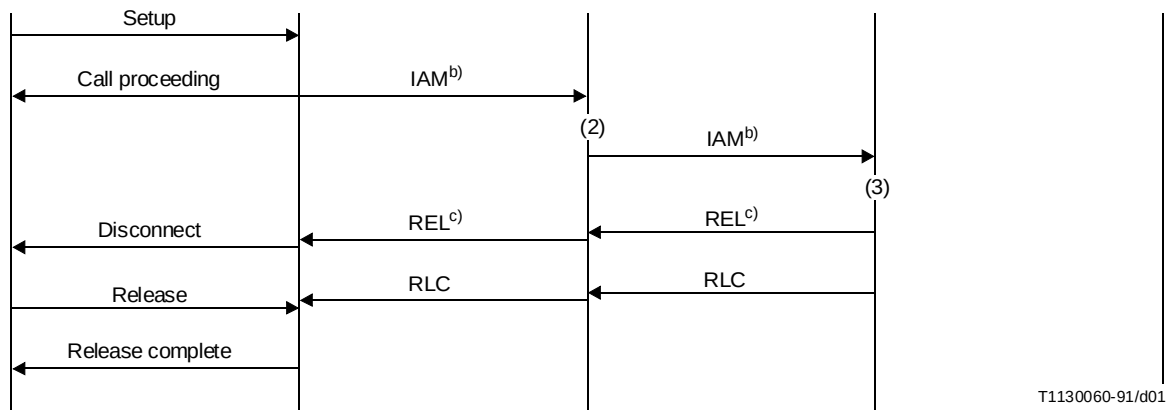
1.8 Signalling flows

Figure 1-1 for the decentralized CUG service.

Figures 1-2 to 1-4 for the centralized CUG service.



a) Successful establishment of a CUG call



b) Unsuccessful establishment of a CUG call

OE Originating exchange
TE Transit exchange
DE Destination exchange
IAM Initial address message
CPG Call progress
ANM Answer message
ACM Address complete message

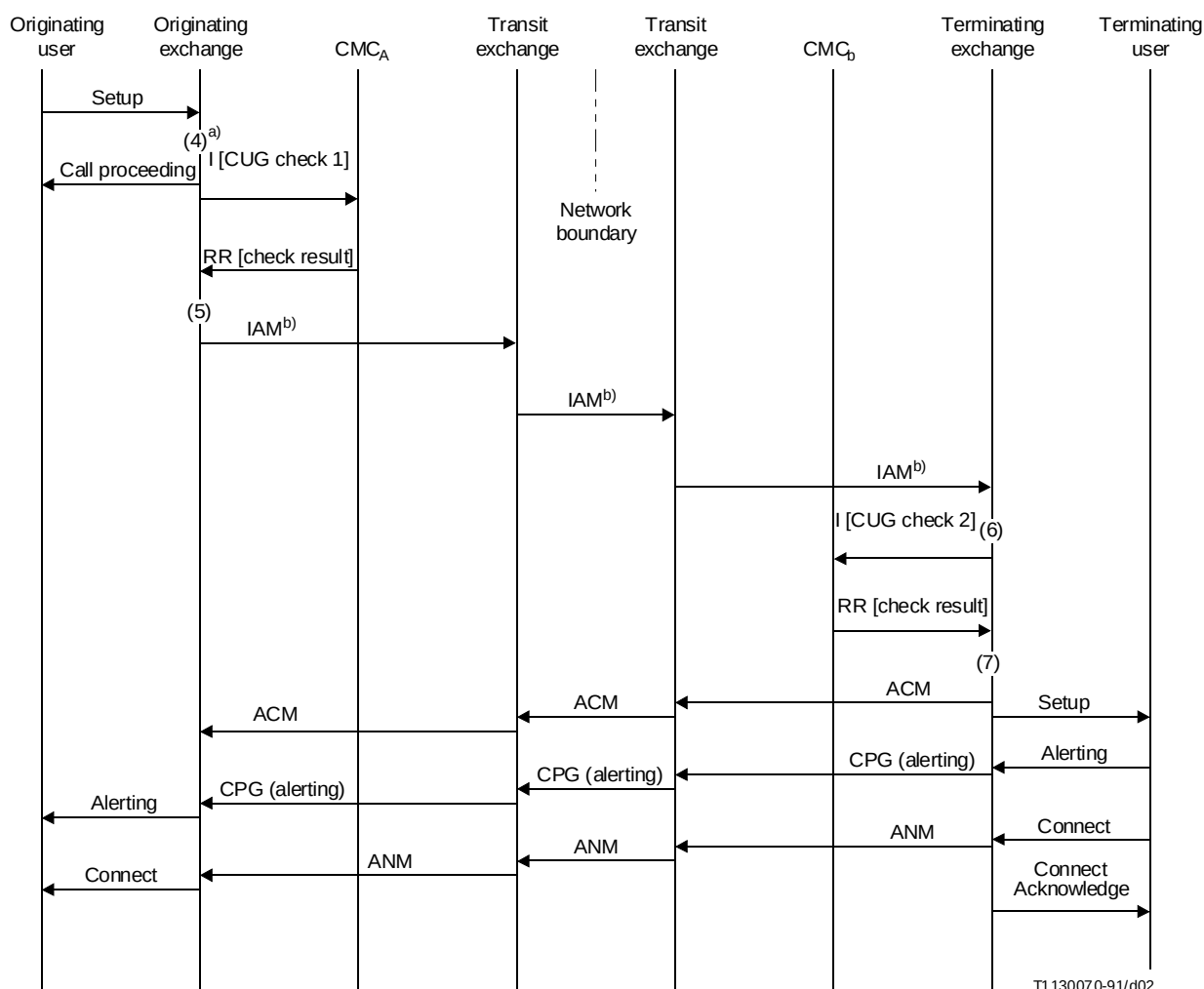
a) () Indicates exchange functions. These are described below Figure 1-2.

b) IAM contains the interlock code and CUG call indication, possibly with outgoing access.

c) REL contains the cause parameter to indicate why the call is being released.

FIGURE 1-1/Q.735

Decentralized operation of CUG



CMC CUG management center
I Invoke
RR Return result

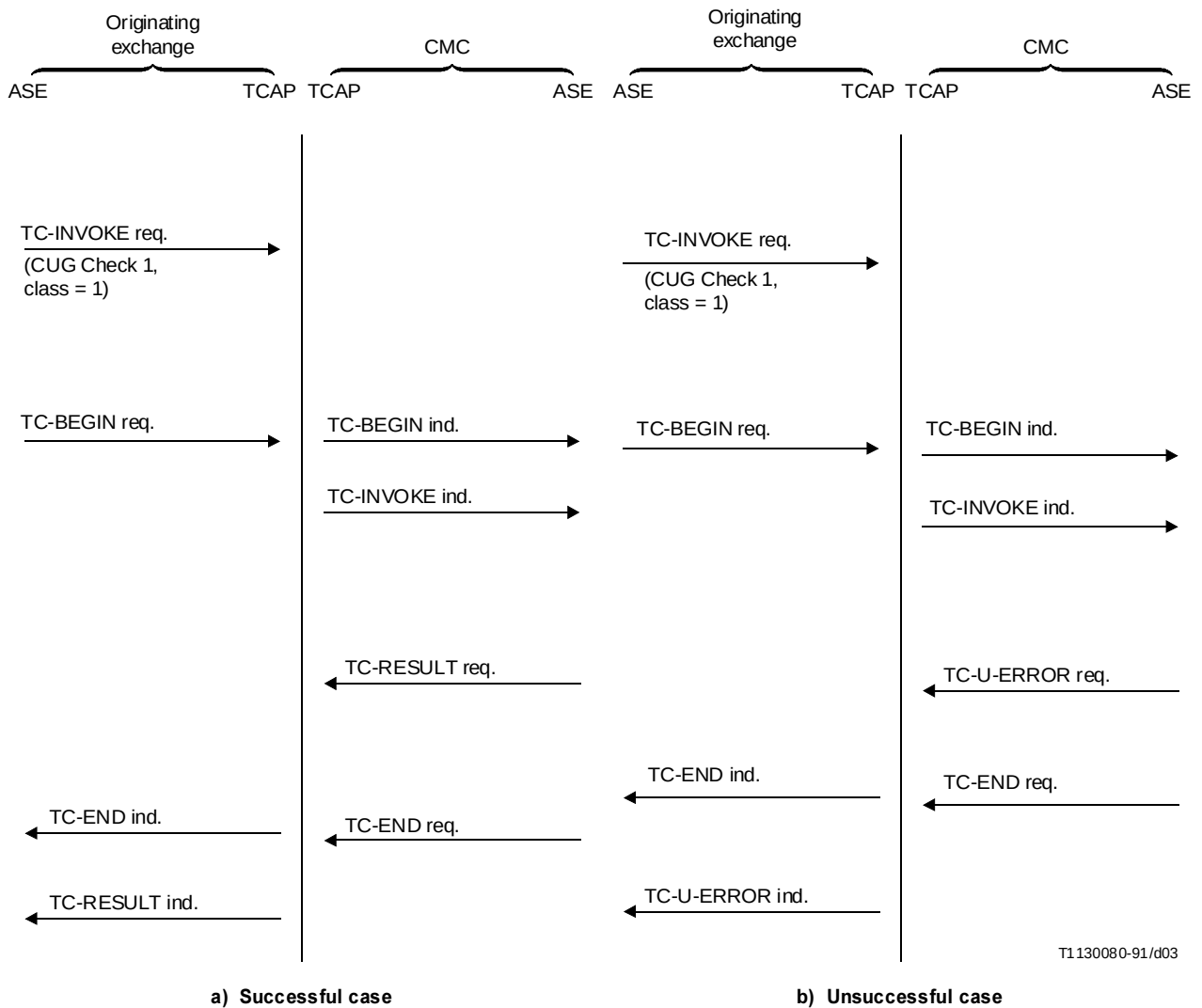
a) () Indicates exchange functions. These are described below.

b) IAM contains the interlock code, CUG call indication possibly with outgoing access.

- (1) Validation check on whether the requested call is allowed to the calling user, based on the data stored at the originating exchange.
- (2) In the case of an international gateway exchange, interlock code conversion if the national network is not using international interlock codes.
- (3) Validation check on whether the requested call is allowed to the called user, based on the data stored at the destination exchange.
- (4) Check if the calling user subscribes to the CUG service.
- (5) Check of the result of the validation check performed in a CMC.
- (6) Check if the called user subscribes to the CUG service.
- (7) Check of the result of the validation check performed in a CMC.

NOTE – Example message flow for a CUG call with centralized administration of CUG data.

FIGURE 1-2/Q.735
Centralized operation of CUG



T1130080-91/d03

FIGURE 1-3/Q.735
Primitive flows between ASE and TCAP for CUG Check 1